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10/635,887	08/06/2003	Yanling Qi	03-0554	1607

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EXAMINER
STIGLIC, RYAN M

ART UNIT	PAPER NUMBER
2112	

DATE MAILED: 11/28/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/635,887	QI, YANLING	
	Examiner	Art Unit	
	Ryan M. Stiglic	2112	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *13 September 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-15,17-19 and 21* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-15,17-19 and 21* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *06 August 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. Claims 1-15, 17-19, and 21 are pending and have been examined.

2. Claims 1-15, 17-19, and 21 are rejected.

Response to Arguments

3. Applicant's arguments with respect to claims 1-15, 17-19, and 21 have been considered but are moot in view of the new ground(s) of rejection. Initially the Examiner had interpreted the term 'path' to refer to the communication medium connecting an initiator to a target, but upon further reviewing applicant's specification (page 14, lines 33-34) a path is referred to as 'an initiator port'. As such a new grounds of rejection is provided below with the interpretation of a path meaning initiator port.

4. The indicated allowability of claim 20 (now incorporated into claims 1, 10, and 15 is withdrawn in view of the newly discovered reference(s) to Flynn Jr. et al. (US Patent No. 6,954,881). Rejections based on the newly cited reference(s) follow.

Specification

5. The disclosure is objected to because of the following informalities: The disclosure is objected to because it contains an embedded hyperlink and/or other form of browser-executable code. Applicant is required to delete the embedded hyperlink and/or other form of browser-executable code. See MPEP § 608.01.

Appropriate correction is required.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. Claims 1-15, 17-19, and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tawill et al. (US006622163B1) in view of Flynn Jr. et al. (US006954881B1).

For claim 1:

Tawill teaches a method for mapping SCSI2 reservation exchanges for use in a SCSI3 storage subsystem, the method comprising:

- receiving a SCSI2 reservation exchange via an associated path(col. 6, ll. 64-65);
- translating the received SCSI2 reservation exchange into a corresponding SCSI3 reservation exchange (col. 3, ll. 2-11; col. 7, ll. 1-6); and
- processing the SCSI3 reservation exchange to manage reservation of an identified portion of storage in the storage subsystem (col. 7, ll. 6-9; col. 3, ll. 2-11).

Tawill however fails to clearly teach translating the received SCSI2 reservation exchange into a corresponding SCSI3 reservation exchange using an unique identifier which identifies an associated path. Tawill teach generating a unique identifier identifying a particular path/initiator

port (col. 4, line 49 – col. 5, line 25) but fail to clearly teach how the unique identifiers are used in translating a SCSI2 reservation exchange into a SCSI3 reservation exchange (col. 7, ll. 1-6).

Flynn teaches mapping open options of the operating system (i.e. SCSI2 commands) to SCSI3 persistent reserve commands thus allowing multiple paths to access the logical unit number of a shared storage system after obtaining a SCSI3 persistent reservation (col. 3, ll. 24-31). The pseudo driver of Flynn teaches that in order to convert an open option (SCSI2 reservation exchange) a reservation key is needed to allow multiple paths of a cluster to have access to a logical unit (col. 7, line 44 – col. 9, line 8). More specifically the pseudo driver generates a single reservation key through which all paths to the logical unit on host are associated with (col. 8, ll. 27-41) thus meeting the claimed limitations of "generating a unique identifier identifying the associated path."

It would have been obvious to one of ordinary skill in the art at the time of the applicant's invention to translate a SCSI2 command into a SCSI3 command using a generated unique identifier identifying an associated path, as suggested by Flynn, into the SCSI2 to SCSI3 translation process of Tawill (col. 7, ll. 1-9) thus providing the added benefit of I/O load balancing to the paths and also lets path failover be used to prevent a node from performing a node failover when an I/O error occurs on a single device path.

For claim 2:

The method of claim 1 wherein the step of processing comprises: forwarding the SCSI3 reservation exchange to the storage subsystem (Tawill; col. 3, ll. 2-11; Flynn; col. 2, line 56 – col. 3, line 41).

For claim 3:

The method of claim 1 wherein the step of translating comprises: translating the received SCSI2 reservation exchange into a corresponding SCSI3 persistent reservation protocol exchange (Tawill; col. 3, ll. 2-11; col. 7, ll. 1-9; Flynn; col. 8, ll. 42-55).

For claim 4:

The method of claim 3 wherein the step of translating to a SCSI3 exchange comprises:

- generating a unique identifier for a requesting host (Flynn; col. 3, ll. 32-40; col. 4, ll. 27-41);
- determining whether the unique identifier is known to the storage subsystem (Flynn; col. 4, ll. 46-55);
- registering the unique identifier within the storage subsystem (Flynn; col. 3, ll. 24-45); and
- translating a received SCSI2 reservation request into a corresponding SCSI3 persistent reservation reserve request using the unique identifier (Tawill; col. 3, ll. 2-11; col. 7, ll. 1-9; Flynn; col. 7, line 44 – col. 9, line 8).

For claim 5:

The method of claim 4 further comprising: translating a received SCSI2 release request into a corresponding SCSI3 persistent clear request using the unique identifier. As applicant is aware, in a SCSI2 subsystem a RELEASE request is used in conjunction with an initially transmitted RESERVE request for reserving a logical unit. Tawill teaches converting/translating a SCSI reservation command (SCSI2 RESERVE request) into a SCSI3 persistent reserve out command (col. 3, ll. 2-11; col. 7, ll. 1-6). As a result the SCSI2 RESERVE request is not present in the storage subsystem. It is therefore implied that if a device wanted to relinquish use of the reservation with a SCSI2 RELEASE request it must be translated into a SCSI3 persistent command with a service action of CLEAR since there exists no SCSI2 reservation in the storage subsystem (only a SCSI3 persistent reservation). Furthermore Flynn teaches that open operating system commands are translated into SCSI3 persistent reservation commands. Flynn goes on to teach "Six service actions supported by Persistent Reserve Out command are …'Clear'… (col. 8, ll. 42-55)"

For claim 6:

The method of claim 5 further comprising: translating a received SCSI2 bus device reset request into a corresponding SCSI3 persistent reservation clear request using the unique identifier (Tawill; col. 7, ll. 12-14).

For claim 7:

The method of claim 4 wherein the step of generating a unique identifier (Reservation key of Flynn) comprises: generating said unique identifier (Reservation key of Flynn) from a WWN associated with the requesting host (Tawill; col. 4, ll. 49-51; col. 5, ll. 17-23).

For claim 8:

The method of claim 4 wherein the step of generating a unique identifier (Reservation key of Flynn) comprises: generating said unique identifier (Reservation key of Flynn) from a WWN associated with an HBA of the requesting host (Tawill; col. 4, ll. 49-51; col. 5, ll. 17-23; According to the specification of the instant application [page 5, paragraph 2] "Each HBA may be a SCSI initiator..." Therefore an HBA is equivalent to an initiator node as seen in Tawill Fig. 1, items 16-22.).

For claim 10:

A system comprising:

- a driver operable in a host system for generating SCSI2 reservation protocol exchanges; (Tawill; Fig. 1, nodes 16-22; col. 6, ll. 15-16; col. 6, ll. 64-65; Flynn; col. 7, line 44 – col. 9, line 8)
- a storage subsystem adapted to process SCSI3 reservation protocol exchanges (Tawill; Fig. 1, 26;col. 4, ll. 21-34; Flynn; Fig. 2, 240; col. 7, line 44 – col. 9, line 8); and
- an id generator that generates a unique identifier identifiying the associated path of the said SCSI2 reservation protocol exchanges (The pseudo driver of Flynn teaches that in

order to convert an open option (SCSI2 reservation exchange) a reservation key is needed to allow multiple paths of a cluster to have access to a logical unit (col. 7, line 44 – col. 9, line 8). More specifically the pseudo driver generates a single reservation key through which all paths to the logical unit on host are associated with (col. 8, ll. 27-41) thus meeting the claimed limitations of "generating a unique identifier identifying the associated path.");

- a translator communicatively coupled to said driver element and communicatively coupled to said storage subsystem and communicatively coupled to said ID generator (Tawill; Fig. 1 38; col. 5, ll. 12-25; As shown in figure 38, the computing device 38 is communicatively with both the nodes [16-22] and storage subsystem [26] through switch 36; Flynn; Fig. 2, pseudo driver 200; col. 7, line 44 – col. 9, line 8), wherein said translator is adapted to translate said SCSI2 reservation protocol exchanges received from said driver into said SCSI3 reservation protocol exchanges (Tawill; col. 3, ll. 2-11; col. 7, ll. 1-6; Flynn; col. 7, line 44 – col. 9, line 8) using the unique identifier (The pseudo driver of Flynn teaches that in order to convert an open option (SCSI2 reservation exchange) a reservation key is needed to allow multiple paths of a cluster to have access to a logical unit (col. 7, line 44 – col. 9, line 8). More specifically the pseudo driver generates a single reservation key through which all paths to the logical unit on host are associated with (col. 8, ll. 27-41) thus meeting the claimed limitations of "generating a unique identifier identifying the associated path.") and wherein said translator is further adapted to forward the SCSI3 reservation protocol exchanges to said storage subsystem (Tawill; col. 7, ll. 6-9; col. 3, ll. 2-11; Flynn; col. 7, line 44 – col. 9, line 8).

For claim 11:

The system of claim 10 wherein the ID generator is configured to generate a host identifier portion (Tawill; col. 4, ll. 49-51; col. 5, ll. 17-23; col. 4, line 60 – col. 5, line 25; A computing device [Fig. 1, 38] is used to establish a fabric [Fig. 1, 28] and assign/manage a list of WWNs and fibre channel Ids of the various nodes of the system.; Flynn; The pseudo driver of Flynn teaches that in order to convert an open option (SCSI2 reservation exchange) a reservation key is needed to allow multiple paths of a cluster to have access to a logical unit (col. 7, line 44 – col. 9, line 8). More specifically the pseudo driver generates a single reservation key through which all paths to the logical unit on host are associated with (col. 8, ll. 27-41) thus meeting the claimed limitations of "generating a unique identifier identifying the associated path.").

For claim 12:

The system of claim 10 wherein the ID generator is configured to generate a host bus adapter identifier portion (Tawill; col. 4, ll. 49-51; col. 5, ll. 17-23; According to the specification of the instant application [page 5, paragraph 2] "Each HBA may be a SCSI initiator…" Therefore an HBA is equivalent to an initiator node as seen in Tawill Fig. 1, items 16-22.; Flynn; The pseudo driver of Flynn teaches that in order to convert an open option (SCSI2 reservation exchange) a reservation key is needed to allow multiple paths of a cluster to have access to a logical unit (col. 7, line 44 – col. 9, line 8). More specifically the pseudo driver generates a single reservation key through which all paths to the logical unit on host are associated with (col. 8, ll. 27-41) thus

meeting the claimed limitations of "generating a unique identifier identifying the associated path.").

For claim 14:

The system of claim 10 wherein said translator is resident within the host system (Tawill; Fig. 1, 38; Flynn; Fig. 1, 200).

For claim 15:

A system for processing SCSI2 reservation requests comprising:

- driver means operable in a host system for generating SCSI2 reservation requests (Tawill; Fig. 1, nodes 16-22; col. 6, ll. 15-16; col. 6, ll. 64-65; Flynn; col. 7, line 44 – col. 9, line 8);
- ID generator means for generating a unique ID for an associated path of the host system; (The pseudo driver of Flynn teaches that in order to convert an open option (SCSI2 reservation exchange) a reservation key is needed to allow multiple paths of a cluster to have access to a logical unit (col. 7, line 44 – col. 9, line 8). More specifically the pseudo driver generates a single reservation key through which all paths to the logical unit on host are associated with (col. 8, ll. 27-41) thus meeting the claimed limitations of "generating a unique identifier identifying the associated path.") and
- translator means operable in the host system and communicatively coupled to the driver means for intercepting SCSI2 reservation requests (Tawill; Fig. 1 38; col. 5, ll. 12-25; As shown in figure 38, the computing device 38 is communicatively with both the nodes

[16-22] and storage subsystem [26] through switch 36; Flynn; Fig. 2, pseudo driver 200; col. 7, line 44 – col. 9, line 8) and for translating the intercepted requests into SCSI3 persistent reservation requests (Tawill; col. 3, ll. 2-11; col. 7, ll. 1-6; Flynn; col. 7, line 44 – col. 9, line 8) using the unique ID (The pseudo driver of Flynn teaches that in order to convert an open option (SCSI2 reservation exchange) a reservation key is needed to allow multiple paths of a cluster to have access to a logical unit (col. 7, line 44 – col. 9, line 8). More specifically the pseudo driver generates a single reservation key through which all paths to the logical unit on host are associated with (col. 8, ll. 27-41) thus meeting the claimed limitations of "generating a unique identifier identifying the associated path.").

For claim 17:

The system of claim 15 wherein the unique ID includes a host identifier portion useful to verify the identity of the host system that generated the unique ID (Tawill; col. 5, ll. 17-23; Keeping a "maintained list" of the WWNs of the devices in storage network implies determining whether the unique identifier is known to the storage subsystem. If a device's unique identifier was not known to the storage subsystem it would not be in the "maintained list."; Flynn; The pseudo driver of Flynn teaches that in order to convert an open option (SCSI2 reservation exchange) a reservation key is needed to allow multiple paths of a cluster to have access to a logical unit (col. 7, line 44 – col. 9, line 8). More specifically the pseudo driver generates a single reservation key through which all paths to the logical unit on host are associated with (col. 8, ll. 27-41) thus

meeting the claimed limitations of "generating a unique identifier identifying the associated path.").

For claim 19:

The system of claim 15 wherein the host system includes multiple paths for communicating with a storage subsystem (Tawill; Fig. 1, "fabric" 28 and "switch" 36; Flynn; figure 3 shows single ended arrows for different available paths) and wherein the ID generator means further comprises: means for generating a unique ID for the host system used in translating said SCSI2 reservation requests on all paths of the host system (Tawill; col. 3, ll. 2-11; col. 7, ll. 1-9; The pseudo driver of Flynn teaches that in order to convert an open option (SCSI2 reservation exchange) a reservation key is needed to allow multiple paths of a cluster to have access to a logical unit (col. 7, line 44 – col. 9, line 8). More specifically the pseudo driver generates a single reservation key through which all paths to the logical unit on host are associated with (col. 8, ll. 27-41) thus meeting the claimed limitations of "generating a unique identifier identifying the associated path.").

For claim 21:

The system of claim 15 wherein the host system includes a host bus adapter associated with each path and wherein the means for generating a unique ID for each path includes: means for generating each unique ID using a world-wide name (WWN) associated with each host bus adapter (Tawill; col. 4, ll. 49-51; col. 5, ll. 17-23; According to the specification of the instant application [page 5, paragraph 2] "Each HBA may be a SCSI initiator…" Therefore an HBA is

equivalent to an initiator node as seen in Tawill Fig. 1, items 16-22.; The pseudo driver of Flynn teaches that in order to convert an open option (SCSI2 reservation exchange) a reservation key is needed to allow multiple paths of a cluster to have access to a logical unit (col. 7, line 44 – col. 9, line 8). More specifically the pseudo driver generates a single reservation key through which all paths to the logical unit on host are associated with (col. 8, ll. 27-41) thus meeting the claimed limitations of "generating a unique identifier identifying the associated path.").

8. Claims 9, 13, and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tawill et al. (US006622163B1) in view of Flynn Jr. et al. (US006954881B1) as applied to claim 4 above, and further in view of what was well known in the art as evidenced by Ciolli et al. (US20020141618A1)..

For claims 9, 13, and 18:

Tawill teaches each node of a storage system is identified by a unique WWN (col. 4, ll. 49-51; col. 5, ll. 17-23; Keeping a "maintained list" of the WWNs of the devices in storage network implies determining whether the unique identifier is known to the storage subsystem. If a device's unique identifier was not known to the storage subsystem it would not be in the "maintained list."). Tawill also teaches a translator communicatively coupled to a driver element and communicatively coupled to said storage subsystem (Fig. 1, 38; col. 5, ll. 12-25; As shown in figure 1, the computing device 38 is communicatively with both the nodes [16-22] and storage subsystem [26] through switch 36), wherein said translator is adapted to translate said SCSI2 reservation protocol exchanges received from said driver into said SCSI3 reservation protocol exchanges (col. 3, ll. 2-11; col. 7, ll. 1-6) and wherein said translator is further adapted to

forward the SCSI3 reservation protocol exchanges to said storage subsystem (col. 7, ll. 6-9; col. 3, ll. 2-11).

Furthermore, Flynn teaches mapping open options of the operating system (i.e. SCSI2 commands) to SCSI3 persistent reserve commands thus allowing multiple paths to access the logical unit number of a shared storage system after obtaining a SCSI3 persistent reservation (col. 3, ll. 24-31). The pseudo driver of Flynn teaches that in order to convert an open option (SCSI2 reservation exchange) a reservation key is needed to allow multiple paths of a cluster to have access to a logical unit (col. 7, line 44 – col. 9, line 8). More specifically the pseudo driver generates a single reservation key through which all paths to the logical unit on host are associated with (col. 8, ll. 27-41) thus meeting the claimed limitations of "generating a unique identifier identifying the associated path."

OFFICIAL NOTICE is taken that digital signatures are well known in the art and one of ordinary at the time of the applicant's invention would have found it obvious to use a digital signature portion indicating generation by said translator in order to verify the integrity of the translated SCSI2 reservation exchange (by confirming that its original digital signature is intact and unaltered) as evidenced by Ciolli et al. (US20020141618A1) paragraph [0188].

Conclusion

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure since it pertains to translating commands from one set to another.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ryan M. Stiglic whose telephone number is 571.272.3641. The examiner can normally be reached on Monday - Friday (6:00-3:30).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Rehana Perveen can be reached on 571.272.3676. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Paul R. Myers

PAUL R. MYERS
PRIMARY EXAMINER

RMS